Please add the following claims: --

15. The method of claim 1, wherein said BBS is a sectorized BBS, said sectorized BBS supporting a plurality of sectors.

16. The system of claim 8, wherein said BBS is a sectorized BBS, said sectorized BBS supporting a plurality of sectors.

17. The system of claim 16, wherein said BBS comprises a plurality of broadband transceivers. --

REMARKS

The foregoing Reply and these Remarks are in response to the Office Action dated April 29, 2002. This Reply is filed within the three month shortened statutory period, and is thus timely filed.

Claims 1-14 were pending in the application at the time of the Office Action. In this reply, Applicant has amended the CROSS REFERENCE TO RELATED APPLICATIONS to now properly claim the benefit of its related provisional application. Applicant has also amended claims 1 and 8 and added claims 15-17. In addition, a typographical error appearing on page 4, line 24 has been corrected herein. A Marked-Up Version To Show Specification and Claim Amendments using standard underlining and bracketing format is provided to highlight the changes made and is attached herein. No new matter is presented.

Applicant notes the objections of the Official Draftsperson's Patent Drawing Review, PTO-948, accompanying the Office Action. Because the objections are formal in nature, Applicant requests that requirement for formal drawings be held in abeyance, until issuance of a

Notice of Allowance, at which time Applicant will submit formal drawings overcoming the objections.

Claims 1-14 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-30 of U.S. Patent No. 6,370,386 to Williams. In response to the double patenting rejection, Applicant has provided an executed terminal disclaimer to overcome the double patenting rejection.

Claims 1-14 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,212,389 to Fapojuwo in view of U.S. Patent No. 5,768,268 to Kline et al. Applicants do not believe that the combination of Fapojuwo and Kline renders the claimed invention obvious. This point will be clear after a review of Applicant's claimed invention, as now recited in amended claim 1(method) and 8 (system) and the cited art, followed by a review of the significant differences between the claimed invention and the cited art.

According to the Examiner:

> Regarding claim 1 Fapojuwo teaches a method for dynamically allocating signal processing resources in a wireless multichannel broadband base station (BBS) for a cellular communications network, said method comprising the steps of (col. 4, line 55- col. 4, line 20, abstract, figs. 1-4):
>
> determing a number of available channel resources which are unused in said BBS, LCM processing any of a plurality of traffic channel assigned to said BBS (col. 7, lines 55-60);
>
> in response to notification of a subscriber call to be processed by said BBS, determining if said number of available CP resources is at least one (col. 7, lines 60-67);
>
> Selecting any of said available CP resources of processing of said call (col. 8, lines 1-7); and
>
> assigning said call to said available CP resource which has been selected (col. 8, lines 7-15, col. 8, lines 16-50, figs. 1-5). Fapojuwo does not specifically teach multiple channel processors for processing any of a plurality of traffic channels. In an analogous art, Kline et al teach mutliple channel processors for processing

any of a plurality of traffic channels (col. 6, line 4-col. 5, line 5). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Fapojuwo by specifically adding multiple channel processors for processing any of a plurality of traffic channels as taught by Kline et al.

Before addressing the claim rejections, Applicant will review the claimed invention as recited in amended claim 1. Claim 1 recites a method for dynamically allocating signal processing resources in a wireless multichannel broadband base station (BBS) for a cellular communications network. The method includes the steps of determining a number of available pooled channel processor (CP) resources which are unused in the BBS. The BBS supports a plurality of cells. Each CP is for processing any of a plurality of traffic channels contained on any frequency channel assigned to the BBS.

In response to notification of a call originating from or to a subscriber in any of the plurality of cells supported by the BBS, it is determined if the number of available CP resources of the BBS is at least one. Significantly, any of the available CP resources can be used to process calls involving subscribers in any of the plurality of cells supported by the BBS. The available CP resource selected is then assigned to process the call. Thus, each CP may process any channel on any RF carrier allocated for any cell independent of any other CPs that may be processing channels on the same or a different RF carrier.

A little background regarding the invention will be helpful in understanding Applicant's invention and the significance thereof. A common cellular system approach makes use of a plurality of directional antennas at the BTS site to split a cell into separate sectors, effectively transforming one cell into multiple cells. Dedicated hardware in the BTS units are typically provided for handling communications for each sector. When using a sectorized approach, the RF channels assigned to a particular BTS must be further allocated among each of the sectors, since interference can be caused if multiple sectors processed by the BTS are operated on the same frequency. Each BTS is provided with CP resources (e.g. DSP units) to support communications processed by the particular BTS to which the DSP unit has been assigned.

Conventional DSP units in such systems are pre-configured to operate on only the particular RF channels which have been assigned to a specific sector of the BTS. Thus, DSP units are not generally fungible as between the plurality cells supported by a particular BTS, such as a plurality of sectors. For example, these DSP units cannot be allocated from one sector to another. In cell sites that experience heavy traffic, this limitation can result in a poor allocation of system resources.

In particular, one of the problems with using sectorization in wireless broadband base stations (BBS) concerns trunking efficiency. Normally, a fixed number of RF carriers is assigned to a sector with the BTS concentrating traffic through a common interface to the PSTN. In many instances, traffic needs in one sector can occasionally exceed the sector's RF and DSP resources while resources may be available in another sector. However, because the number of RF channels allocated to a sector is fixed in conventional BBS systems, those resources can be blocked and left unused, lowering the trunking efficiency of the BBS. Applicant's claimed invention importantly substantially solves the blocking problem experienced by a BBS by making available any of the DSP resources to process any traffic channel contained on any of the plurality of RF carriers supported by the BBS, irrespective of the allocation of RF carriers to particular cells supported by the BBS.

Fapojuwo discloses methods and apparatus for controlling allocation of traffic channels in a telecommunications network having macrocells and microcells within the macrocells. A macrocell traffic channel is allocated in response to a request for a microcell traffic channel only when no suitable microcell traffic channel is available, a suitable macrocell traffic channel is available, and the requested microcell traffic channel is requested to implement a microcell to microcell handoff. Allocation of the macrocell traffic channel may further be conditional on a grade of service in the macrocell being deemed acceptable. The grade of service may be deemed acceptable when number of macrocell traffic channels assigned to each microcell is less than a predetermined maximum number of allowable macrocell traffic channels that can be assigned to each microcell (cutoff value) or when more than a threshold number of macrocell channels are

available in the macrocell. The system determines whether a call is a data call and implements throttling of the channels allocated to existing data calls to optimize system capacity and data throughput.

Contrary to the Examiner's characterization of Fapojuwo, Applicant respectfully submits that Fapojuwo does not disclose or suggest a method for dynamically assigning signal processing resources in a wireless multichannel broad band base station (BBS), because Fapajuwo does not disclose a BBS. In addition, the base station disclosed by Fapajuwo clearly does not support Applicant's claimed plurality of cells. Accordingly, the base station disclosed by Fapajuwo cannot perform the important function provided by Applicant's claimed BBS, namely, the ability to select and assign any of the available base station CP resources for processing calls originating from or to subscribers in any of the plurality of cells served by the BBS.

Fapajuwo does not disclose a BBS because a BBS is well known in the art as a base station that utilizes a multicarrier broadband transceiver, the broadband transceiver for converting a block of spectrum between RF and baseband. The block of spectrum contains multiple RF carriers. Fapojuwo discloses macro and micro base station and cells and does not disclose or suggest Applicant's BBS which supports a plurality of cells, such as a multi-sector base station because a macro base station is not equivalent to BBS. Macro and micro simply refer the geographic area that the base station covers. And as described in Fapojuwo, the area coverage of a micro cell (BTS) is typically within the coverage area of a macro cell. Thus, the base station disclosed by Fapojuwo does not support a plurality of cells, nor is it a BBS.

Fapojuwo's method cannot be used to improve capacity of the claimed BBS which supports a plurality of cells. Fapojuwo allocates calls to different cells supported by different base stations (macro and micro), depending upon the availability of an available channel in one of those base stations. The goal of Fapojuwo is to maximize capacity and throughput based on assigning calls in hierarchical macro-/micro- cellular network. In contrast, the present invention permits improved efficiency regarding use of resources within a single BBS. In the claimed invention as recited in amended claim 1, the BBS supports a plurality of cells, such as a tri-

sectored base station where each sector supports a cell. Because CP resources can be used to support any call to subscribers in any cell supported by the BBS, Applicant's BBS can support a higher capacity of subscribers than prior art multi-cell (e.g. sectored) narrowband base stations which inherently have processing resources blocked and result in the limitation that each processing resource can only support calls on specific physical channels.

According to the Examiner, Kline makes up for Fapojuwo's deficiency regarding multiple channel processors for processing any of a plurality of traffic channels. Applicant disagrees and notes that the deficiency noted above by the Examiner regarding Fapojuwo is only one of the many deficiencies highlighted by Applicant above.

Kline discloses an open-architecture digital cellular base station which includes a wideband digital transceiver system having transmit and receive sections. Within the transmit section, an input line interface operates to couple a plurality of input information signals onto a time-division multiplexed (TDM) transmit bus. A plurality of digital transmitter modules are coupled to the TDM transmit bus, each of the digital transmitter modules generating a set of digital baseband signals in response to a corresponding set of the plurality of input information signals. The set of digital information signals are applied to a wideband summation network disposed to sequentially add the set of digital information signals into a wideband data stream. A wideband transmitter then generates a wideband transmission waveform using the wideband data stream. The receive section includes a wideband receiver for: (i) receiving an incident composite signal, and (ii) generating a digital representation of the incident composite signal in the form of a wideband digital data stream applied to a wideband data bus. A plurality of digital receiver modules are coupled to the wideband data bus. Each digital receiver module functions to recover a set of digital output signals from the wideband digital data stream, as well as to multiplex the set of digital signals onto a TDM receive bus. An output line interface serves to distribute the digital output signals among a plurality of output signal lines.

Applicant notes that unlike Fapojuwo, Kline does disclose an architecture for a wideband (i.e. broadband) basestation. However, Kline does not describe a BBS having channel processing

resources that can process signals originating from or to cellular subscribers in any of the plurality of cells supported by the BBS. While it is true that Kline's "DTX" (transmit) modules 80 and "DRX" modules 28 include channel processing (CP) resources for baseband processing, these modules are fixed to a given sector and cannot be allocated to any other sector. The DTX or DRX modules support all of the baseband processing (modulator, demodulator, channel coding, etc.) and also support up conversion (transmit) and down conversion (receive) to/from IF, respectively, for the wideband transmitter, "WBTX", or wideband receiver, "WBRX". None of these processing resources (DTX and DRX) are allocable to any sector since they are fixed to a specific sector. In contrast, Applicant's recited BBS provides the ability to select and assign any of the available base station CP resources for processing calls originating from or to subscribers in any of the plurality of cells served by the base station. Therefore, Kline clearly does not make up for Fapajuwo's deficiencies. Accordingly, Applicant submits that amended claim 1 is patentable over the cited art. Dependent claims 2-7 and 15 are patentable at least on the basis of their dependence on patentable base claim 1.

System claim 8 has been amended to recite the patentable features recited in amended claim 1. Specifically, amended claim 8 now recites "means for determining a number of available pooled channel processor (CP) resources which are unused in said BBS, said BBS supporting a plurality of cells, each said CP processing any of a plurality of traffic channels contained on any frequency channel assigned to said BBS" and "means responsive to notification of a call originating from or to a subscriber in any of said plurality of cells". Accordingly, based on distictions noted relative to amended claim 1 as compared to Fapajuwo and Kline, Applicant submits that amended claim 8 is patentable over the cited art. Dependent claims 9-14, 16 and 17 are patentable at least on the basis of their dependence on patentable base claim 1.

Applicant has made every effort to present claims which distinguish over the prior art, and it is believed that all claims are in condition for allowance. However, Applicant invites the Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance.

Respectfully submitted,

Date: 7/25/02

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Docket No. 6785-109

Marked-Up Version To Show Changes

IN THE SPECIFICATION:

Replace lines 4-6 in their entirety with the following: --

CROSS REFERENCE TO RELATED APPLICATIONS

The present application claims the benefit of U.S. provisional patent application number 60/104,441 filed on October 15, 1998, the entirety of which is incorporated herein by reference. [This application is a continuation-in-part of provisional application having Serial No. 60/104,441.]

Replace page 4, line 22-page 5, line 7, with the following:

Some companies, such as AirNet Communications Corporation of Melbourne, Florida, use a broadband base station (BBS) rather than the BTS described above. Such systems are disclosed in U.S. Pat. Nos. 5,535,240 and [5,940,834] 5,940,384. In this BBS, a broadband transceiver is used for transmitting and receiving a single composite wideband RF waveform that is comprised of a number of frequency channels, rather than the multiple narrow-band transceivers used in the BTS for transmitting and receiving individual frequency channels. By replacing the narrow band transceivers of the BTS with a broadband transceiver, this architecture reduces the number of transceivers required to process a given number of frequency channels; however, this alone still does not solve the trunking problem associated with the BTSs. The architecture and configuration of conventional BBSs may still suffer from limited trunking efficiency, as the BBS can still only process a fixed number of calls due to dedicated processing sources serving a specific transceiver and therefore a specific sector.

IN THE CLAIMS:

1. (Amended) A method for dynamically allocating signal processing resources in a wireless multichannel broadband base station (BBS) for a cellular communications network, said method comprising the steps of:

determining a number of pooled available channel processor (CP) resources which are unused in said BBS, said BBS supporting a plurality of cells, each said CP processing any of a plurality of traffic channels contained on any frequency channel assigned to said BBS;

in response to notification of a [subscriber] call originating from or to a subscriber in any of said plurality of cells, [to be processed by a cell of said BBS, and] determining if said number of available CP resources of said BBS is at least one;

selecting any of said available CP resources for processing of said call; and

assigning said call to said available CP resource which has been selected.

8. (Amended) A resource management system for dynamically allocating signal processing resources in a wireless multichannel broadband base station (BBS) for a cellular communications network, comprising:

means for determining a number of available pooled channel processor (CP) resources which are unused in said BBS, said BBS supporting a plurality of cells, each said CP processing any of a plurality of traffic channels contained on any frequency channel assigned to said BBS;

means responsive to notification of a [subscriber] call originating from or to a subscriber in any of said plurality of cells [to be processed by said BBS,] for determining if said number of available CP resources is at least one;

means for selecting any of said available CP resources for processing of said call; and

means for assigning said call to said available CP resource which has been selected.